REMARKS/ARGUMENTS

In response to the Final Rejection dated September 18, 2006, Claims 1-13, 15-23 and 26-27 now remain in this application. Claims 1, 16 and 22 have been amended. Claims 14, 24 and 25 have been canceled.

The specification was objected to.

Claims 24 and 25 were objected to.

Claims 1-25 were rejected under 35 USC 112, 2nd paragraph.

Claims 1-25 were objected under 35 USC 103(a).

Specification

The specification was objected to as failing to provide proper antecedent basis for the claimed subject matter. Specifically, the recitation in Claims 1 and 22 of an "insulating layer insulating said conductive insert from said conductive base plate" lacks antecedent basis in the specification.

The objected-to language has been removed from the claims, and therefore it is felt that this objection has been overcome.

Claim Objections

Claims 24 and 25 were objected to. These claims have been canceled and therefore is felt that this objection has been overcome.

Claim Rejections - 35 USC § 112

Claims 1-25 are rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the terms "high dielectric filler" and "high breakdown voltage" in claims 1, 22, 24 and 25 are relative

terms which render the claims indefinite. The remaining claims are rejected due to their dependence on independent claims 1 or 22.

The objected-to language has been removed from the claims, and therefore it is felt that this rejection has been overcome.

Claim Rejections - 35 USC § 103

First Rejection: Claims 1-4, 6-13, 17, 18, and 22-24 are rejected under 35 USC 103(a) as being unpatentable over U.S. Pat. No. 6,321,134 (Henley et al.) in view of U.S. Pat. No. 6,432,260 (Mahoney et al.); U.S. Pat. No. 5,542,559 (Kawakami et al.); and U.S. Pat. Appln. Publ. No. 2002/0036881 (Shamouilian et al.).

The two independent claims, namely Claims 1 and 22, have both been amended to recite the following combination: a reentrant conductive conduit, coupled to an RF power applicator, whose openings to the chamber are on opposing sides of the chamber and span the process region to establish a reentrant path that extends across the process region, and a gas distribution plate (or array of gas openings) in the ceiling which is encircled by the reentrant path, and an insulating gap in the conduit.

Mahoney et al. cannot locate his gas distribution apparatus in his ceiling because it would be blocked by his plasma-ignition electrode 30 that covers his ceiling. There is no teaching in any of the references that would motivate the skilled worker to eliminate Mahoney's plasma-ignition electrode 30.

None of the references disclose an insulating ring in a conductive reentrant conduit with a toroidal path passing across the wafer surface. The Examiner erroneously points to Smith et

al. for this feature (in the rejection of Claim 14, much of the language of which is now incorporated into Claims 1 and 22). However, Smith et al. teaches an approach which is incompatible with the claimed invention, namely one in which the toroidal source is located in a remote chamber 20 separate from the process chamber 22 containing the wafer (Smith et al., Column 5 lines 65-67). Claims 1 and 22 clearly require that the toroidal path pass directly through the process region of the wafer. As for combining Smith et al. with Mahoney et al., Smith concerns a completely different type of apparatus, namely a remote gas source, whereas Mahoney has nothing to do with a remote gas source, and therefore there is no reason or motivation for adopting a feature from Smith et al. in to Mahoney et al. nor any basis for believing such an adaptation would improve anything in Mahoney et al.

More importantly, the skilled worker would have no motivation to use Smith et al. in an ion implantation apparatus because one object of the Smith et al. apparatus is "to provide a source of activated gas for materials processing **where there is no significant energetic ion bombardment**" (Smith et al., Column 2 lines 27-32). With no ion energy, there could be no ion implantation. Since Smith's gas source chamber is remote from his wafer process chamber, it is not possible to attain any significant ion energy (for ion implantation) even if it were tried. Therefore, the combination of the references does not suggest the combination of Claim 1 nor the combination of Claim 22.

Second Rejection: Claim 5 is rejected under 35 USC 103(a) as being unpatentable over Henley et al. in view of Mahoney et

al., to Kawakami et al., and Shamouilian et al., and further in view of U.S. Pat. No. 6,643,557 (Miller et al.). Claim 5 depends from Claim 1 and is therefore patentable upon the same basis.

Third Rejection: Claim 14 is rejected under 35 USC 103(a) as being unpatentable over Henley et al. in view of Mahoney et al., to Kawakami et al., and Shamouilian et al., and further in view of U.S. Pat. No. 6,150,628 (Smith et al.). Much of the language of Claim 14 has been incorporated into Claims 1 and 22 and Claim 14 has been canceled. This rejection is discussed in the foregoing arguments concerning Claim 1.

Fourth Rejection: Claims 15, 16, and 19-21 are rejected under 35 USC 103(a) as being unpatentable over Henley et al. in view of Mahoney et al., to Kawakami et al., and Shamouilian et al., and further in view of U.S. Pat. No. 5,571,366 to Ishii et al.

Claims 15 and 16 specify a structure in which the reentrant path is constricted in the process region sufficiently to increase the current density there relative to the remainder of the reentrant path. This requires, of course, that the path be narrower in the process region overlying the wafer than it is in the external conduit. The Examiner states that Ishii et al. suggests such a restriction. There is no such suggestion because Ishii's lift mechanism movement is not disclosed relative to any external conduit, and therefore combining Ishii with Mahoney, for example, would not lead the skilled worker to set the height travel limit of a lift mechanism to constrict the space above the wafer to a constriction more limited than an external conduit. Without the hindsight of applicants' invention, there would be no

special relationship in such a hypothetical combination between the lift mechanism elevation limit and an external reentrant conduit size or area or anything else. Therefore, reconsideration of the rejection of Claims 15 and 16 is respectfully requested based upon the claim language of Claim 15, "said ceiling comprises a constriction of said reentrant toroidal path" and of Claim 16, "said reentrant path being more constricted at said gas than elsewhere along said reentrant path".

As for the rejection of Claims 19-21, there is no suggestion of the use of an RF bias for ion implantation, nor is there a suggestion of limiting the frequency as claimed in Claim 19 or Claim 20 or Claim 21.

Fifth Rejection: Claim 25 is rejected under 35 USC 103(a) as being unpatentable over Henley et al., in view of Mahoney et al., to Kawakami et al., and Shamouilian et al., and further in view of U.S. Pat. No. 6,558,508 (Kawakami et al.) and U.S. Pat. Appln. Publ. No. 2002/0053513 (Stimson et al.). Claim 25 has been cancelled.

New Claims 26 and 27 are patentable because they claim a combination unknown in the prior art, namely the use of at least transverse toroidal reentrant paths. One advantage of this combination is that the crossing of the oscillating toroidal plasma currents in the process region improves process uniformity at the wafer surface.

In summary, all the pending claims are patentable, and allowance is respectfully requested.

Respectfully submitted,

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